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10/055,164	10/29/2001	Wade W. Smith	WMS-15	9573

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EXAMINER	
BORISSOV, IGOR N	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/055,164
Filing Date: October 29, 2001
Appellant(s): SMITH, WADE W.

Spencer T. Smith
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/12/2006 appealing from the Office action mailed 04/23/2004.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 4,509,679 Longini Apr. 9, 1985

US 5,415,024 Proffitt et al. May 16,1995

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Longini (US 4,509,679) in view of Proffitt et al. (US 5,415,024) and further in view of Official Notice.

As per claims 1 and 4,

Longini teaches an energy use monitoring system within an apartment unit, including a pump with known flow and pressure characteristics (column 3, lines 38-39), digital thermometers installed upstream and downstream the apartment (column 2, lines 41-44), a digital flow meter (column 2, line 29), and a microprocessor with build in relationship between pressure and flow, and known flow and pressure characteristics of the pump (column 3, lines 40-41, 55-60); wherein a quantity of energy used by each apartment unit is proportional to the volume of fluid received, which is metered by change in flow, multiplied by the temperature difference between the received and the returned water (column 1, lines 54-62). The readings for each unit are accumulated over time, suggesting the identification of each unit (column 1, lines 63-64). Furthermore, Longini teaches a digital pressure meter used for measuring the difference in pressure

produced by the pump, said pressure meter is utilized to increase the accuracy of measurement and calculations (column 3, lines 41-60).

However, Longini does not specifically teach a pair of pressure transducers to be connected proximate the upstream and downstream the apartment for supplying pressure data to the microprocessor. Also, Longini does not specifically teach that computation of energy use, which is conducted by multiplying the change in flow by the temperature difference between the received and the returned water, includes a multiplication of square root of change in pressure by said temperature difference.

Proffitt et al. (Proffitt) teach an apparatus for analysis of multiphase fluid by measuring an energy input and heat loss from the apparatus, comprising an insulation (18), pressure and temperature sensors disposed upstream and downstream from insulation (18) for continuously computing a change in pressure and temperature, and a controller to which the input of measurements are directed (column 3, lines 55-column 4, lines 25; column 9, lines 5-7). Furthermore, Proffitt teaches that use of said apparatus allows accurate calculation of characteristics of multiphase fluid through application of the ideal gas laws and thermodynamic principles (column 4, lines 22-39).

Official notice is taken that it is well known from thermodynamic principles that flow (in conduits) is proportional to the square root of the pressure change across it controlling flow impedance.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Longini to include a pair of pressure transducers to be connected proximate the upstream and downstream of the heat

exchange device, as disclosed in Proffitt, and include that that computation of energy use is conducted by multiplying a square root of change in pressure by said temperature difference, because it would advantageously increase the accuracy of energy used measurement. As per *first* and *second* computational means, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Longini in view of Proffitt et al. and further in view of Official Notice to include a plurality of computational means, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Longini in view or Proffitt further in view of Official Notice and further in view of Saar et al. (US 6,430,514).

As per claim 3, Longini, Proffitt and Official Notice teach all the limitations of claim 3, except that the serial number of the heat transfer device is transmitted.

Saar et al. teach a water management system for an apartment including a number of water consuming devices each equipped with flow and temperature metering monitors, wherein each monitor transmits a data package to a host computer, said data package including a serial number (column 2, lines 2-4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Longini, Proffitt and Official Notice to include that the

serial number of the heat transfer device is transmitted to a host computer, as disclosed in Saar et al., because it would advantageously enhance the accuracy of volumetric calculations in water monitoring systems.

Allowable Subject Matter

Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 2. Longini, Proffitt and Official Notice teach an energy use monitoring system within an apartment unit comprising pressure and temperature sensors disposed upstream and downstream from a heat transfer device for computing a change in pressure and temperature, and a programmable logic controller to which the input of measurements are directed.

However, Longini and Proffitt do not teach means for multiplying the accumulated computed square root of the change in pressure times the change in temperature by:

a. the time duration between the periodic multiplying of the square root of the change in pressure times the change in temperature,

b. 8.33, and

c. a constant defined by dividing a flow rate by the square root of the pressure drop across the heat transfer device for the flow rate defined in a manufacturer's catalog for that heat transfer device.

(10) Response to Argument

The Applicant argues that Proffitt is not relevant to the Claim 1.

In response to said argument, the examiner points out that Claim 1 recite a *system* for monitoring the use of *heat energy*, including *pressure/temperature transducers placed upstream and downstream of heat exchange* device for supplying pressure and temperature data to *computational means*.

Proffitt teaches an *apparatus* for analysis of multiphase fluid by *measuring an energy input* and *heat loss* from the apparatus, including *pressure and temperature sensors disposed upstream and downstream from insulation (18) (heat exchange device*), for providing pressure and *temperature data to a controller* (column 3, lines 55-column 4, lines 25; column 9, lines 5-7). Furthermore, Proffitt specifically teaches that use of said apparatus includes *measuring an energy input and heat loss* from the apparatus with application of the ideal gas laws and thermodynamic principles (column 4, lines 22-39). Therefore, the examiner stipulates that Proffitt is relevant for the Applicant's invention.

The Applicant argues that unlike Longini and Proffitt, which measure flow at the device, Claim 1 measures the square root of the change in pressure across the heat transfer device.

In response to said argument, the examiner asserts that it is well known from thermodynamic principles that flow (in conduits) is proportional to the square root of the pressure change across it controlling flow impedance. This fact is well established in the

art and has been numerously documented. As an example, the following references explicitly teach that the flow through an orifice of constant area is proportional to the square root of the pressure drop across the orifice:

US 3,645,094	(C. 2, L. 20-27)
US 3,672,401	(C. 1, L. 40-44)
US 3,690, 341	(C. 2, L. 54-57)
US 3,731,876	(C. 1, L. 20-23)
US 3,750,710	(C. 2, L. 30-41)
US 4,779,631	(C. 8, L. 64-68)
US 5,323,657	(C. 28, L. 50-55)
US 5,352,213	(C. 10, L. 40-44)

Furthermore, Longini specifically teaches a *microprocessor with build in relationship between pressure and flow* (column 3, lines 40-41, 55-60).

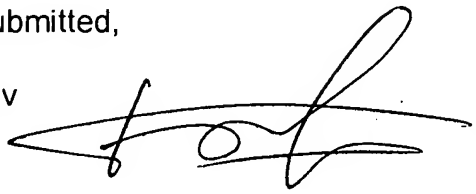
Therefore, the examiner stipulates that teachings of Longini, specifically, calculating a quantity of energy used by each apartment by measuring change in flow multiplied by the temperature difference between the received and the returned water (column 1, lines 54-62), said calculation been performed by the microprocessor with build in relationship between pressure and flow, is equivalent to recited in Claim 1 calculation the square root of the change in pressure across the heat transfer device.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Igor N. Borissov  03/30/2006

Conferees:

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